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II. Solution by J. SCHEFFER, A. M., Hagerstown, Md.

Let in a triangle ABC $AB>AC$, and BE and CD be the bisectors of angles B and C of the triangle, cutting AC and AB in E and D, respectively. To prove $CD<BE$.

Through E draw EH parallel to CB. Draw HI parallel to AC, and HK parallel to DC, cutting AC in K. It is evident that $HE=HB$, and $HE=EK$; moreover, $\angle HIB=\angle ACB>\angle HBI$. Therefore, $BH>HI$, and hence $EK>HI$ or EC. The point K, therefore, lies on AC produced, and hence, the point D between A and H. Comparing the two triangles BHE and HEK, we see at once that $BE>HK$. But $CD<HK$, *a fortiori*. Therefore $CD<BE$.

Also solved by Henry Heaton, A. H. Holmes, Rev. J. H. Meyer, and G. B. M. Zerr.

286. Proposed by S. F. NORRIS, Baltimore City College, Baltimore. Md.

On the sides of a given triangle measure off equal distances from the extremities of the base, and at these points erect perpendiculars to the sides. Find the locus of the point of intersection of these perpendiculars. Solve by methods of analytic geometry.

Solution by G. B. M. ZERR, A. M., Ph. D., Parsons, W. Va.

Let ACB be the triangle, AB the base. Lay off $AE=BD=d$ on the two sides AC, BC, and erect perpendiculars at E and D cutting each other at H, and CB and AC at F and G, respectively. Then $CE=b-d$, $CF=(b-d)\sec C$.

Hence $\dfrac{x}{(b-d)\sec C}+\dfrac{y}{b-d}=1$, is the equation to EF..........(1).

Also $CD=a-d$, $CG=(a-d)\sec C$, and $\dfrac{x}{a-d}+\dfrac{y}{(a-d)\sec C}=1$, is the equation to DG..........(2). Now (1) and (2) may be written as follows:

$$x\cos C+y=b-d \text{........} (3),$$
$$x+y\cos C=a-d \text{.........} (4).$$

Eliminating d we get $x-y=\dfrac{a-b}{1-\cos C}=\tfrac{1}{2}(a-b)(\operatorname{cosec}\tfrac{1}{2}C)^2$, as the locus of H, the intersection required.

Also solved by G. W. Greenwood, Henry Heaton, A. H. Holmes, and J. Scheffer.

287. Proposed by G. W. GREENWOOD, M. A., McKendree College, Lebanon. Ill

Show that the points whose abscissae are 0, $a\sqrt{3}$, and $-a\sqrt{3}$ are points of inflexion on the locus $x^2y-a^2x+a^2y=0$.

Solution by the PROPOSER.

Let P be the point whose abscissa is $a\sqrt{3}$ and whose ordinate is therefore $\dfrac{a\sqrt{3}}{4}$. Let Q be any point on the curve. The coördinates of Q are, therefore,